

LESSON 1 Why Do We Want to Know

Lesson at a Glance

In this lesson, students brainstorm what should be in a weather forecast. They will get the opportunity to create a forecast of their own. The students will take their created forecast and compare/contrast it with an actual forecast from a media outlet. Students will also discuss how we use components of a weather forecast and some of the technology that makes weather forecasts possible.

Lesson Duration

Two 45-minute periods

Essential Question(s)

Why do we want to know the weather?
How is weather forecasted?

Key Concepts

- Weather forecasts help to plan our lives
- Weather forecasts include many inferences based on collected data
- Weather affects our daily lives
- The use of technology is an integral part of weather forecasting

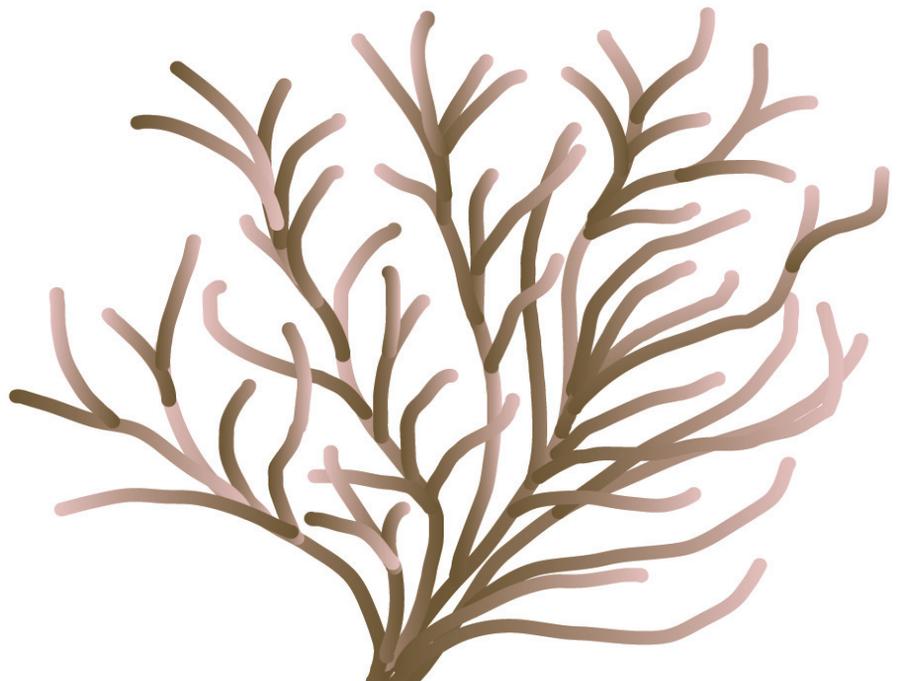
Instructional Objectives

- I can identify the parts of a weather forecast.
- I can ask questions about how the data to forecast weather is gathered.
- I can compare and contrast my forecast with a forecast made in a newspaper. (or on TV or the internet)
- I can identify the role of technology in weather forecasting.

Related HCPSIII Benchmark(s):

Science SC.4.2.1
Describe how the use of technology has influenced the economy, demography, and environment of Hawai'i.

Language Arts LA 4.6.1
Participate in grade-appropriate oral group activities.



Assessment Tools

Benchmark Rubric:

Topic		Science, Technology, and Society	
Benchmark SC.4.2.1		Describe how the use of technology has influenced the economy, demography, and environment of Hawai'i	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Explain how the use of technology has influenced the economy, demography, and environment of Hawai'i and suggest ways to conserve the environment	Describe how the use of technology has influenced the economy, demography, and environment of Hawai'i	Give examples of how the use of technology has influenced the economy, demography, and environment of Hawai'i	Recognize that the use of technology has influenced the economy, demography, and environment of Hawai'i

Topic		Discussion and Presentation	
Benchmark LA.4.6.1		Participate in grade-appropriate oral group activities	
Rubric			
Advanced	Proficient	Partially Proficient	Novice
Participate in grade-appropriate oral group activities, in a highly effective way	Participate in grade-appropriate oral group activities	Participate in grade-appropriate oral group activities, in a limited way or in a way that only partially facilitates the group's work	Participate very little in grade-appropriate oral group activities or participate in a way that does not facilitate the group's work



Assessment/Evidence Pieces

Lesson

- Pre-assessment (Formative Assessment Probe)
 - Student created weather forecast
- Evidence Pieces
 - Compare/contrast of weather forecasts
 - Diagram of weather forecasts
- Exit Pass: What is the role of technology in weather forecasting? (Optional)

Materials Needed

Teacher	Class	Group	Student
<ul style="list-style-type: none"> • Computer projector (optional) • Computer with Internet access • Method to chart student responses 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • 5.5 x 8.5-inch white sheet of paper • Access to weather forecasts (old newspapers, internet access with streaming video capabilities, internet print outs, etc.)

Instructional Resources

Teacher Reading: *Weather Forecasting*

Student Worksheet: *Venn Diagram*

Student Vocabulary Words

forecast: to predict (a future condition or occurrence).

Lesson Plans

Lesson Preparation

- Review the Science Background provided in the Unit Overview and the Teacher Reading *Weather Forecasting*.
- If choosing to do the optional activity with the Venn diagram, then make copies of Student Worksheet *Venn Diagram*, one per student.

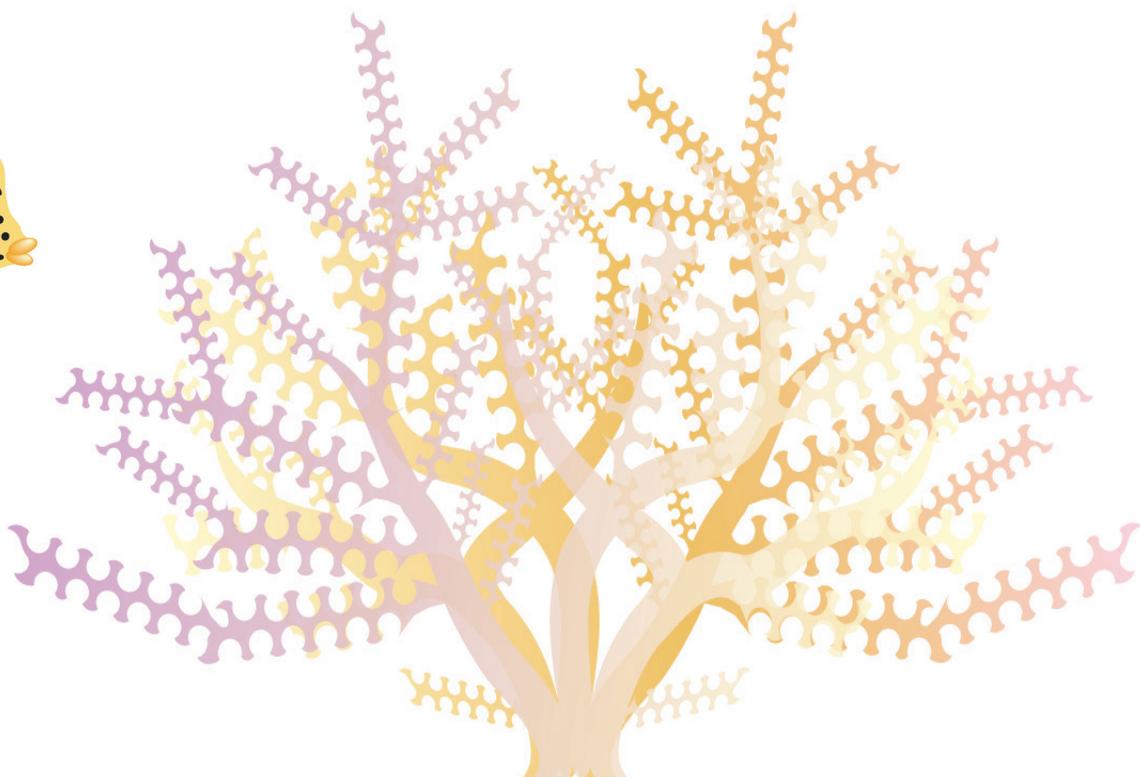
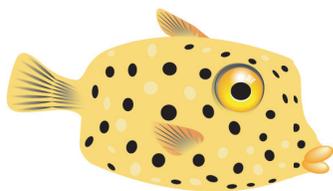
- Have sample weather forecasts ready for student use.
*Note: if using the internet, bookmarking local news stations' web pages may reduce time needed to find sources.
- Familiarize yourself with the information found on your local news sites. (e.g. television news, newspapers, etc.)

I. *Pre-assessment (Formative Assessment Probe)*

- A. Give students a sheet of paper and have them write down what they think the weather will be like tomorrow.
 - 1) Students may ask for clarification on the task. Assure them that anything that they write is acceptable.
 - 2) The teacher may choose to use this as a starting point and use any corrections/updates to this preliminary forecast to monitor student progress through the unit. This forecast may serve as a pre-assessment of student's prior knowledge.
- B. Collect the forecasts from the students.

II. *Class Discussion*

- A. Discuss with students what the word *forecast* means. Ask students to assess whether their forecast predicted what the weather may be like tomorrow.
- B. Discuss with students how did they choose what to include in their forecast. (For example, why didn't they say that it would snow in Hawai'i?)
 - 1) This discussion could draw out the students own ideas on climate vs. weather
- C. Ask students what things they included in their forecasts.
Suggestion: Teacher may want to chart student responses and use the chart to add new ideas as students learn about weather forecasts throughout the unit.



III. Weather forecasting

- A. Pass out sample forecasts to the students. The picture below is of a weather forecast that can be found on the National Weather Service Forecast Office website. (<http://www.prh.noaa.gov/pr/hnl/>) Other forecasts are available in newspapers, on television, or on local media sites' web pages. [Optional: Project a written or televised forecast for the entire class to use.]

NWS Honolulu, HI
 Point Forecast: 3 Miles ENE Whitmore Village HI
 Last Update: 11:42 am HST Mar 16, 2010
 21.53°N 157.96°W (Elev. 1640 ft)
 Forecast Valid: 12pm HST Mar 16, 2010-6pm HST Mar 22, 2010

Forecast at a Glance

This Afternoon	Tonight	Wednesday	Wednesday Night	Thursday	Thursday Night	Friday	Friday Night	Saturday
40% Scattered Showers Hi 70 °F	50% Scattered Showers Lo 58 °F	30% Scattered Showers Hi 71 °F	40% Scattered Showers Lo 56 °F	50% Scattered Showers Hi 69 °F	80% Showers Lo 59 °F	70% Showers Likely Hi 68 °F	70% Showers Likely Lo 58 °F	50% Scattered Showers Hi 67 °F

Detailed 7-day Forecast
 Hazardous weather condition(s):
High Surf Advisory
 This Afternoon: Scattered showers. Mostly cloudy, with a high near 70. East wind around 9 mph. Chance of precipitation is 40%. New rainfall amounts of less than a tenth of an inch possible.
 Tonight: Scattered showers. Mostly cloudy, with a low around 58. East wind between 3 and 6 mph. Chance of precipitation is 50%. New rainfall amounts between a tenth and quarter of an inch possible.
 Wednesday: Scattered showers. Mostly cloudy, with a high near 71. Light and variable wind. Chance of precipitation is 30%. New rainfall amounts of less than a tenth of an inch possible.
 Wednesday Night: Scattered showers. Mostly cloudy, with a low around 58. North wind between 6 and 10 mph. Chance of precipitation is 40%. New rainfall amounts of less than a tenth of an inch possible.
 Thursday: Scattered showers. Mostly cloudy, with a high near 69. Northeast wind between 14 and 16 mph, with gusts as high as 25 mph. Chance of precipitation is 50%. New rainfall amounts between a tenth and quarter of an inch possible.
 Thursday Night: Frequent showers. Low around 59. Northeast wind around 11 mph. Chance of precipitation is 80%. New rainfall amounts between a tenth and quarter of an inch possible.
 Friday: Showers likely. Mostly cloudy, with a high near 68. East wind around 11 mph. Chance of precipitation is 70%.
 Friday Night: Showers likely. Mostly cloudy, with a low around 58. North wind around 9 mph. Chance of precipitation is 70%.
 Saturday: Scattered showers. Mostly cloudy, with a high near 67. Northeast wind between 9 and 13 mph. Chance of precipitation is 50%.
 Saturday Night: Showers likely. Mostly cloudy, with a low around 59. East wind around 14 mph. Chance of precipitation is 60%.
 Sunday: Scattered showers. Mostly cloudy, with a high near 69. East wind around 14 mph. Chance of precipitation is 50%.
 Sunday Night: Showers likely. Mostly cloudy, with a low around 60. East wind around 14 mph. Chance of precipitation is 60%.
 Monday: Scattered showers. Mostly cloudy, with a high near 69. East wind around 14 mph. Chance of precipitation is 50%.

Current Conditions [Move Down] view Yesterday's Weather
 Wheeler Army Airfield
 Lat 21.48 Lon -158.03 Elev. 827
 Last Update on Mar 16, 10:55 am HST
 Humidity: 62 %
 Wind Speed: Vrot 7 MPH
 Barometer: 30.11" (1018.5 mb)
 Dewpoint: 62 °F (17 °C)
 Heat Index: 78 °F (26 °C)
 Visibility: 10.00 mi.
 More Local Wx: 3 Day History

A Few Clouds
 76 °F
 (24 °C)

Radar and Satellite Images

Detailed Point Forecast [Move Up]
 Click Map for Forecast Disclaimer
 Map Satellite Terrain
 Requested Location Forecast Area
 Lat/Lon: 21.53°N 157.96°W Elevation: 1640 ft
 XML

NOAA > NWS > WFO Honolulu

Click on the map below for the latest forecast.

Read watches, warnings & advisories. Zoom Out

High Surf Advisory
 Small Craft Advisory
 Marine Weather Statement

Last map update: Tue, Mar. 16, 2010 at 11:39:07 am HST
 The UVI for noon, MAR 17 in Honolulu is 10. This is a very high exposure level.

Enter latitude/longitude pair in decimal degrees (i.e. 21.28 -157.83)
 Latitude Longitude
 21.28 -157.83 GetPoint Forecast

Point Forecasts for Selected Locations Shortcuts
 Downtown Honolulu (Oahu) GetPoint Forecast

Use the drop down menu to select an alternate link to zone forecasts.
 - Oahu South Shore GetZone Forecast

Forecast at a Glance for Honolulu Airport

TODAY	WED	THU	FRI	SAT	SUN	MON
MAR 16	MAR 17	MAR 18	MAR 19	MAR 20	MAR 21	MAR 22
Hi: 81 Lo: 67	Hi: 81 Lo: 67	Hi: 79 Lo: 68	Hi: 79 Lo: 66	Hi: 79 Lo: 68	Hi: 81 Lo: 68	Hi: 81 Lo: 69

Use the following drop down menu to change the forecast at a glance to a city near you. Then bookmark that page to always see that city's forecast at a glance when you visit.
 Lihue GetQuick Forecast

<http://forecast.weather.gov/MapClick.php?map.x=153&map.y=86&site=hfo>

- B. Have students identify the various pieces of information given on the forecast. An optional Venn Diagram student worksheet is given to help students compare/contrast their forecast with the examples from the local media.
 *Note: Other graphic organizers may be used, or students could design their own method for comparing/contrasting. A Venn diagram is included as one option to use with students.

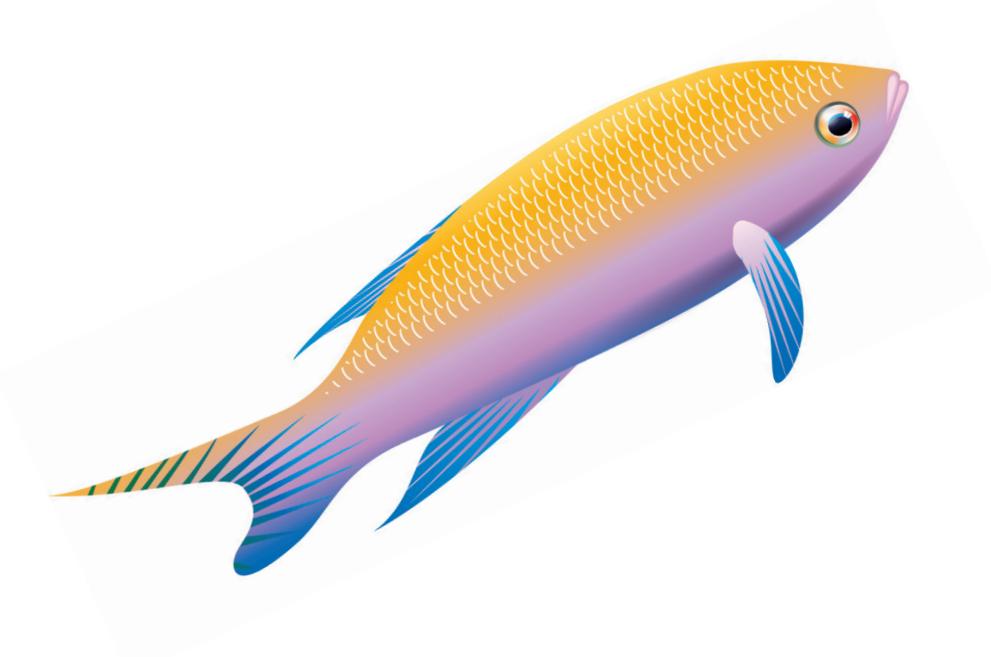


- C. Students may identify the following items during their compare/contrasts of weather forecasts:
- 1) Temperature (high and low)
 - 2) Humidity
 - 3) Cloud cover
 - 4) Rain
 - 5) Surf advisories
 - 6) Wind speed
- D. Have students brainstorm why different components of a forecast would be important.
- 1) For example, students might've said that temperature is important because it helps us to decide what clothes to wear the next day.
 - 2) Suggestion: This part of the discussion may be done as a whole class, in groups, or even using a think-pair-share strategy where students brainstorm individually, then share with a partner, then share with a bigger group, before sharing with the entire class.
- E. Discuss with students the types of technology that make weather forecasts possible. Suggested questions to guide this discussion include:
- 1) What types of technology may have been used to create the media forecasts we studied?
 - 2) How does technology impact weather forecasting?
- F. Have students then list questions that they have about weather forecasting. Please keep this list readily available. The next lesson will address any question(s) about how weather is forecast.
- G. Exit Pass (optional): Have students write a short, constructed response to the following question: What is the role of technology in weather forecasting?

Suggestion: Project or display the weather report from the newspaper or media site daily throughout the unit.

Extended Activity

1. Introduce and discuss the history of the National Weather Service (see Teacher Reading for this lesson). Make connections back to the previous discussion on technology by asking: How has technology impacted the delivery of weather forecasts over time?



LESSON 1 Teacher Reading - Weather Forecasting

History of the National Weather Service

The National Weather Service has its beginnings in the early history of the United States. Weather has always been important to the citizenry of this country, and this was especially true during the 17th and 18th centuries.

The beginning of the National Weather Service we know today started on February 9th, 1870, when President Ulysses S. Grant signed a joint resolution of Congress authorizing the Secretary of War to establish a national weather service. This resolution required the Secretary of War

“to provide for taking meteorological observations at the military stations in the interior of the continent and at other points in the States and Territories...and for giving notice on the northern (Great) Lakes and on the seacoast by magnetic telegraph and marine signals, of the approach and force of storms”

After much thought and consideration, it was decided that this agency would be placed under the Secretary of War because military discipline would probably secure the greatest promptness, regularity, and accuracy in the required observations. Within the Department of War, it was assigned to the Signal Service Corps under Brigadier General Albert J. Myer. General Meyer gave the National Weather Service its first name: *The Division of Telegrams and Reports for the Benefit of Commerce*.

Later that year, the first systematized, synchronous weather observations ever taken in the U.S. were made by “observing-sergeants” of the Army Signal Service at 22 stations and telegraphed to Washington. An agency was born which would affect the daily lives of most of the citizens of the United States through its forecasts and warnings.

From: <http://www.weather.gov/pa/history/index.php>

For more background information on weather forecasting, please visit the following website:

<http://Earthobservatory.nasa.gov/Features/WxForecasting/wx.php>



IV. Ulysses S. Grant

NAME: _____

DATE: _____

Venn Diagram

